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RESEARCH MANUSCRIPT

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Prevalence and determinants of depressive symptoms among adults in Indonesia: A cross-sectional population-based national survey

Erni Astutik[1] | Atik Choirul Hidajah[2] | Tika Dwi Tama[3] | Ferry Efendi[4,5] | Chung-Yi Li[2,6]

[1]Research Group for Health and Wellbeing of Women and Children, Department of Epidemiology, Faculty of Public Health, Universitas Airlangga, Surabaya, East Java, Indonesia

[2]Department of Epidemiology, Faculty of Public Health, Universitas Airlangga, Surabaya, East Java, Indonesia

[3]Department of Public Health, Faculty of Sport Science, Universitas Negeri Malang, Malang, East Java, Indonesia

[4]Department of Community Health and Mental Health Nursing, Faculty of Nursing, Universitas Airlangga, Surabaya, East Java, Indonesia

[5]Visiting Fellow, School of Nursing and Midwifery, La Trobe University, Melbourne, Australia

[6]Department and Graduate Institute of Public Health, College of Medicine, National Cheng Kung University, Tainan, Taiwan

Correspondence
Erni Astutik, Research Group for Health and Wellbeing of Women and Children, Department of Epidemiology, Faculty of Public Health, Universitas Airlangga, Mulyorejo, Surabaya 60115, East Java, Indonesia.
Email: erniastutik@fkm.unair.ac.id

Abstract

Aims: To analyze the association between personal health conditions (self-rated health, physical function, and chronic conditions) and symptoms of depression in Indonesia.

Methods: Data were collected from the Indonesian family life survey 5. This study used a cross-sectional study design with a sample size of 17,734 respondents. We included depressive symptoms, self-rated health, physical function, chronic conditions, demographics and socioeconomic variables. The center for epidemiologic studies depression scale was used to measure symptoms of depression. Multivariate logistic regression analysis was used to analyze the data.

Results: The results showed that 23.47% of respondents had depressive symptoms, 20.04% had poor self-rated health, 55.93% had a poor physical function, and 32.37% had at least one chronic disease. Respondents who had poor self-rated health, had poor physical function, or had a chronic condition were all had a significantly higher odds of experiencing symptoms of depression after controlling for demographic variables (age, sex, married, and education level), social-economic, and smoking status.

Conclusion: Depressive symptoms were significantly associated with personal health conditions including self-rated health, physical functioning, and chronic conditions among community residents. Strategies that can improve personal health conditions needed to be studied at the community level to improve the level of mental health.

KEYWORDS

chronic conditions, depressive symptoms, IFLS, physical function, self-rated health

1 | INTRODUCTION

Depression is a major cause of disability worldwide and contributes greatly to the overall burden of the disease.[1] Depression is also predicted to be will be one of the most worrying conditions in the year 2020 and will be a global health burden.[2] The 2012 Mental Health Survey conducted in 17 countries found 1 in 20 people reported experiencing depression in the previous year.[3] Economic impacts resulting from depressive symptoms are enormous. Depression is estimated to lead economic losses of $210.5 billion per year. This economic burden resulted from loss of productivity at work and medical costs.[4] A study using data from the Korean

Longitudinal Study of Aging in 2010, with 7672 respondents found that the average score of depressive symptoms with the center for epidemiologic studies depression scale (CES-D) was 7.53.[5] Studies in Australian adults showed that the prevalence of depressive symptoms was 16.9%.[6]

Based on data from the 2013 on the basic health research, the prevalence of mental disorders in the Indonesian population was 6%[7] and it increased to 9.8% in 2018.[8] The prevalence of depressive symptoms varied across the province, it ranged between 3.6% and 19.8%.[8] Basic health research 2018 also reported that 6.1% of Indonesian over 15 years old were diagnosed with depression by the Mini International Neuropsychiatric Interview, but only 9% of them accessed medical treatment.[8] Studies in Indonesia using the Indonesian family life survey 4 (IFLS 4) data found that the prevalence of depressive symptoms were 7.2%, reporting the greatest prevalence of symptoms those older ≥70 years.[9] A migration study conducted in Indonesia with IFLS 3 and 4 data found that 11.5% of respondents reported having poor health and 11.7% experienced depressive symptoms.[10] The average symptom depression score on the CES-D-10 scale on IFLS 3 were 3.9.[10]

The extended Whitelaw and Liang's[11] theoretical model proposed by Boehme, Geiser, & Renneberg explained that physical functioning reflects specific aspects of quality of life-related to health where individuals are able to adapt to their environment.[12] Self-rated health refers to individuals' perceptions of their current health and have been shown to be strong predictors of morbidity, hospitalization, and mortality.[13–15] Some studies have found that disability, diseases, and poor health status and perceptions of self-rated health are risk factors for the occurrence of depression.[5,16–19]

Research conducted on the elderly population of Pakistan suggested that poor physical function was associated with increased symptoms of depression.[20] Suffering from chronic diseases also doubled the risk of depression.[21-24] This association between chronic diseases and depression related to the psychological stress that arises due to the severity of chronic diseases experienced and how much it affects the life of the individuals.[22] Depression symptoms are commonly experienced by people who suffer cancer, diabetes, stroke, chronic obstructive pulmonary disease, and heart disease.[20,25–27] Other types of chronic conditions, such as hypertension, liver disease, arthritis, and kidney disease, also elevate the risk of depression symptoms over time.[21,23,26–28] A study conducted using systematic review and meta analysis reported that depressive symptom was higher in outpatient settings.[29] In addition, depressive symptom was also higher in people who had poor self-rated health.[30]

Symptoms of depression have become a public health concern in Indonesia because of the increasing trend of cases, lack of awareness and its high disease burden attributable.[7,8,31,32] There was limited research that assesses the relationship between personal health conditions and depressive symptoms among Indonesian. A study that used national data from a longitudinal survey could give more information to decide on the necessary preventive strategies, whether targeted for the general population, selected groups, or indicated groups (high-risk individuals). Some of these preventive strategies are modifying risk factors, promotion and education program, counseling program, stress management, resilience skill training, and enhancing family and community support program.[33,34] The purpose of this study was to investigate the relationship between self-rated health, physical function, and chronic conditions to the symptoms of depression.

2 | MATERIALS AND METHODS

2.1 | Study design

This study used data from the IFLS 5. The IFLS is a longitudinal and sustainable survey of socioeconomic and health status. This survey collected data about individuals, families, households, and the communities, including the health and educational facilities they used.[35] The IFLS 5 was carried out at the end of 2014 and early 2015 with 16,204 households and 50,148 individuals were interviewed face to face. Out of 2622 individuals four were excluded from the interview due to death.[35]

2.2 | Sampling

Started in 1993, the IFLS was based on a sample of households representing about 83% of the Indonesian population, living in 13 of 26 provinces. Enumeration areas (EAs) were randomly selected from the sample framework used in SUSENAS 1993 (socioeconomic survey of around 60,000 households. The IFLS randomly selected 321 enumerations in 13 provinces. In the selected EA, the field team randomly selected households based on the 1993 SUSENAS list obtained from the regional BPS office.[36] The 17,334 respondents IFLS survey analysis was limited to IFLS 5.

2.3 | Data collection

Depression data measured using the 10-item CES-D statements. Each statement was assessed rarely or never, little, sometimes, and often. Individuals with a score of 10 or more are considered higher depressive symptoms and less than 10 are considered lower depressive symptoms.[37–41] Personal health conditions are measured in three dimensions, namely self-rated health,[41] chronic condition,[41] and physical functioning. Self-rated health is measured by asking the respondent what your current health condition is in general. The item questions were coded 1 = very unhealthy, 2 = sometimes unhealthy, 3 = sometimes healthy, and 4 = very healthy. Respondents have good self-rated on health if they answered sometimes healthy and very healthy. Respondents have poor self-rated on health if they answered sometimes unhealthy and very unhealthy. Chronic conditions are measured by asking the respondent whether the doctor/paramedic/nurse/midwife has said that the respondent has a condition or disease. By definition,

chronic conditions are a long-lasting disease and are not easily cured. Code 1 was used if the respondent answered yes and code 3 was used if the respondent answers no. The following are chronic conditions measured in this study, namely hypertension, diabetes, tuberculosis, asthma, other chronic lung diseases, heart attacks, liver or liver disease, stroke, rheumatic cancer, high cholesterol, kidney disease, digestive disorders, psychological problems, and diseases related to memory.[7,41-44] Physical functioning is measured by using a scale of physical functioning. There are 11 statement items. Each statement item is coded with 1 if the answer is easy, 3 if the answer is difficult, and 5 if the answer is unable. The value of each statement item will be calculated and categorized according to the median cut of point. If the score of physical functioning ≥13, it means that physical function is poor; and if the score is less than 13, it means that the physical function is good.

The demographic and socioeconomic variables studied included coverage, sex, marital status, education, income, and smoking status. Age was measured based on the age of the respondent during the survey. Sex consists of male and female. Marriage status was coded 1 if the respondents were married and coded 0 if not married, separated, widowed, and living together. Educational status was coded if 1 = no school, 2 = elementary/equivalent, 3 = junior high/equivalent, 4 = high school/equivalent, and 5 = D1, D2, D3, S1, S2, S3. Family income was measured by a log of family income over the past 12 months in rupiah. Smoking status was measured by using the question of whether the respondent has ever had the habit of chewing, smoking tobacco using pipes or rolling it himself or smoking cigarettes or cigar and whether the habit still continues today. If the respondents answered that it was still going on, it was coded 1 and if they answered "no" and had stopped, it was coded 0.

2.4 | Data analysis

Descriptive analysis was used to describe each of the research variables. χ^2 test was used to assess the relationship between covariate variables and outcome variables. Multivariate logistic regression with the backward method was used to investigate the significant factors related to poor depressive symptoms after controlling for demographic, socioeconomic, and smoking status variables. STATA 14 was used to perform the analysis, and a $p < .05$ was considered statistically significant.

3 | RESULTS

Data from 17,334 respondents were available for analysis. The average age of the respondents was 38.78 years. More than half of the respondents were males (60.72%) and married (79.01%). There were around 42.64% of respondents who smoked. Approximately 3.38% of respondents had never taken education and only 30.13% of respondents had ever attended elementary school. The average income of respondents was 20,367,220 ± 38,959,740 Indonesia rupiahs (Table 1).

Table 1 shows that 23.47% of respondents had higher symptoms of depression. The proportion of respondents who felt unwell was 20.04%. More than half of the respondents rated their physical functioning as poor (55.93%). Respondents who had chronic conditions were 32.27%, consist of 23.25% reported having one chronic condition and 9.02% having more than one chronic condition.

In bivariate analysis, self-rated health, physical functioning, chronic conditions, number of chronic conditions, age, sex, income,

TABLE 1 Characteristics of respondents and distributions of depressive symptoms, self-rated health, physical functioning, and chronic conditions of respondents

Variables (*N* = 17,334)	*N*	%	Mean ± *SD*
Age (years)			38.78 ± 12.99
Sex			
Female	6809	39.28	
Male	10,525	60.72	
Married			
Otherwise	3639	20.99	
Married	13,695	79.01	
Level of education			
Unschooled	586	3.38	
Elementary	5222	30.13	
Junior	3235	18.66	
Senior	5471	31.56	
College	2820	16.27	
Income (IDR)			20,367,220 ± 38,959,740
Smoking			
Non-active smoking	9942	57.36	
Active smoking	7392	42.64	
Depressive symptoms			
Lower	13,265	76.53	
Higher	4069	23.47	
Self rated health			
Good	13,860	79.96	
Poor	3474	20.04	
Physical functioning			
Good	7639	44.07	
Poor	9695	55.93	
Chronic condition			
No	11,741	67.73	
Yes	5593	32.27	
Number of chrnic condition			
None	11,741	67.73	
1	4030	23.25	
More than 1	1563	9.02	

marital status, level of education, and smoking had a significant association with depressive symptoms (Table 2). In multivariate logistic regression analysis, personal health conditions (self-rated health, physical functioning, and chronic conditions) were significantly associated with depressive symptoms. Respondents who had poor self-rated health had 2.13 times higher odds of experiencing depressive symptoms (odds ratio [OR] = 2.13; 95% confidence interval [CI] = 1.95 to 2.31; $p < .001$) (Table 3). Respondents who had poor physical functioning had 1.47 times higher odds of experiencing depressive symptoms compared with the respondents who had good physical functioning (OR = 1.47; 95% CI = 1.36 to 1.59; $p < .001$). In addition, the respondents who had chronic disease conditions also had 1.38 times higher odds of experiencing depressive symptoms (OR = 1.38; 95% CI = 1.27 to 1.49; $p < .001$) (Table 3).

4 | DISCUSSION

This study found that respondents who had poor self-rated health conditions had a higher risk of experiencing depressive symptoms compared to respondents who felt healthier after controlling for other covariates. The findings are consistent with previous studies showing that poor self-rated health conditions may predict future depression.[45,46] The research conducted by David Östberg also showed that those with poor self-rated health conditions showed more severe symptoms of depression and anxiety, compared to those who had good health conditions.[47] Good self-rated health was reported to be negatively related to depression.[48] Respondents with perceived good health had a lower risk of getting depression regardless of sex.[30] However, the risk of depressive symptoms experienced by poor self-rated health respondents in this study was

TABLE 2 Bi-variate analysis of variables in relation to depressive symptoms

		Depressive symptoms			95% Confident interval		
Variables (*N* = 17,334)	*N*	Lower (%)	Higher (%)	Crude odds ratio	Lower	Upper	*p* Value
Self rated health							
Poor	3474	63.80	36.20	Ref			
Good	13,860	79.69	20.31	2.22	2.04	2.40	<.001
Physical functioning							
Good	7639	81.46	18.54	Ref			
Poor	9695	72.64	27.36	1.66	1.54	1.78	<.001
Chronic condition							
No	11,741	78.44	21.56	Ref			
Yes	5593	72.50	27.50	1.38	1.28	1.49	<.001
Number of chronic conditions							
None	11,741	78.44	21.56	Ref			
1	4030	74.24	25.76	1.26	1.16	1.37	<.001
More than 1	1563	68.01	31.99	1.71	1.53	1.92	<.001
Age				0.98	0.98	0.98	<.001
Sex							
Female	6809	74.80	25.20	Ref			
Male	10,525	77.64	22.36	0.85	0.80	0.92	<.001
Married							
Otherwise	3639	69.83	30.17	Ref			
Married	13,695	78.31	21.69	0.64	0.59	0.70	<.001
log income				0.91	0.90	0.93	<.001
Level of education							
Unschooled	586	79.52	20,48	Ref			
Elementary	5222	75.14	24.86	1.28	1.04	1.59	.020
Junior	3235	75.80	24.20	1.24	1.00	1.54	.051
Senior	5471	75.98	24.02	1.23	0.99	1.51	.056
College	2820	80.35	19.65	0.95	0.76	1.18	.645
Status of smoking							
Non-active Smoking	9942	77.07	22.93	Ref			
Active smoking	7392	75.80	24.20	1.07	1.00	1.15	.051

TABLE 3 Adjusted odds ratio of depressive symptoms in relation to perceptions of health (health conditions, physical functioning, and chronic conditions)

Variables (*N* = 17,334)	Adjusted odds ratio	95% Confident interval		*p* Value
		Lower	Upper	
Self rated health				
Good	Ref			
Poor	2.13	1.95	2.31	<.001
Physical functioning				
Good	Ref			
Poor	1.47	1.36	1.59	<.001
Chronic condition				
No	Ref			
Yes	1.38	1.27	1.49	<.001
Age	0.97	0.97	0.98	<.001
Sex				
Female	Ref			
Male	0.90	0.81	1.00	.055
Married				
Otherwise	Ref			
Married	0.75	0.69	0.82	<.001
Log income	0.94	0.92	0.96	<.001
Level of education				
Unschooled	Ref			
Elementary	1.12	0.90	1.40	.304
Junior	0.90	0.72	1.14	.406
Senior	0.91	0.73	1.15	.446
College	0.78	0.61	0.99	.047
Status of smoking				
Non-active smoking	Ref			
Active smoking	1.30	1.17	1.43	.000

lower than in previous studies. In this study, poor self-rated health doubled the depressive symptoms risk, while other studies reported that poor self-rated health increased the risk odds depressive symptoms by three to four-fold.[47,49] Differences in respondent characteristics may be related to this finding. This study only represented the productive age group (15–49 years old) and the majority of them were male. Those characteristics were known to have better health conditions and experience less depressive symptoms.[50–52]

Self-rated health described the individual perception of how healthy he or she is. Study conducted in China found that self-rated health can indicate the actual current health condition.[53] The laboratory parameters that were used to evaluate objective health status were significantly associated with self-rated health.[53] If someone considers being healthy, then the possibility of experiencing depression decreases.[30] This association may be related to happiness value. People who rate their general condition on a lower scale reflect their pessimistic perspectives. Pessimistic perception is one of the symptoms of depression.[54]

Physical function independently associated with depressive symptoms. This study reported that more physical functional limitations were experienced, the risk of depressive symptoms increased. This finding was in line with the study conducted in German and Norway.[55] The reciprocal relationship between physical decline and depression is quite universal.[56] This relationship can be caused by a decrease in physical function that will cause disability and loss of productivity so that people who are not physically capable will have difficulty in performing their functions socially and biologically causing the person to isolate themselves, and they will get depression later.[56–58] Another longitudinal study found that depression and disability usually occur together.[59] The presence of a physical condition (e.g., joint or articular extremity; back pain; headache; gastrointestinal disease) increased the duration of a major depressive mood.[60] Chronic pain has been associated with the development of depression.[61] In addition, sociological factors and culture and traditions that developed in society could make a person more depressed over his physical disabilities.[56] Positive social support can reduce depressive symptoms. Social support affects individual interpersonal. Depressed individuals can have interpersonal problems interacting with others.[62–64]

Chronic diseases lead the increasing of depressive symptoms. Previous study also reported the similar findings, symptoms of depression was associated with chronic medical illnesses,[65–67] especially if these chronic diseases cause pain and fatigue or limit a person's ability to interact with others. Symptoms of depression can intensify pain, fatigue, and lethargy.[68] For example, in our study, we found that there were 24.12% of respondents who had higher depressive symptoms and diabetes. This is in line with research conducted on Chinese immigrants.[41] In addition, similar findings were also found in people who suffered from chronic diseases, such as stroke, asthma,[69–71] arthritis, heart disease, cancer, obesity, and diabetes.[43] On average, between 9.3% and 23% of respondents with one or more chronic physical illnesses had comorbid depression.[72]

Some research limitations need to be recognized. In this study, researchers used a cross-sectional design and only used IFLS 5 data. Therefore, further analysis based on longitudinal data is needed. With the longitudinal method, it can be known that changes in the potential predictors for depressive symptoms over time will affect the impact of symptoms of depression in the next survey. In addition, the measurement of health status is only measured by using one question about the health condition of the respondents in general. This may not represent the overall health condition of the respondent. Further research is necessary to measure individual satisfaction and health-seeking behavior as potential confounders. Nevertheless, the IFLS 5 instruments collected detailed individual-level data and had high reinterview rates thas supporting multipurpose analysis. The IFLS 5 instruments collected all retrospective data of new respondents and updated the information of panel respondents.[35] The large sample size is one of the strengths of this

study. The sample in this study represented 83% of the population in Indonesia. Therefore, the results of this study show a general picture experienced by people in Indonesia.

Findings from our study are important because we have entered an era where the severity and prevalence of mental illness are evolved. This study highlighted several important challenges faced by people in Indonesia including factors that cause depressive symptoms, such as personal health conditions, physical function, and chronic disease conditions. The government can take advantage of this study to develop an intervention program concerning how to improve good perceptions of health, maximize physical function so that it can be productive, and minimize the number and condition of chronic diseases. Besides that, the development of intervention programs needs to be done by engaging stakeholders, healthcare administrators, clinicians, and healthcare providers.

5 | CONCLUSION

The main results of this study gives evidence that poor self-rated health, poor physical function, and having chronic disease have an increased risk for experiencing depression symptoms occurrence. This study used national data so the results were likely to describe the problem of depression in Indonesia. These findings suggest the need for intervention and strategies to raise self-awareness and preserve subjective wellbeing. Educational programs to increase the awareness of the population on depression symptoms and depression prevention need to consider these three components to support depression reduction programs.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

ETHICS STATEMENT

The IFLS has been approved by ethics review boards of RAND and University of Gadjah Mada in Indonesia.[32]

ORCID

Erni Astutik http://orcid.org/0000-0003-2934-1290
Atik Choirul Hidajah https://orcid.org/0000-0002-9797-1887
Tika Dwi Tama https://orcid.org/0000-0003-4963-8243
Ferry Efendi http://orcid.org/0000-0001-7988-9196
Chung-Yi Li https://orcid.org/0000-0002-0321-8908

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